

## Two New Species of Sub-Arctic American Orthoptera

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Recently I published a report on the Orthoptera of Alaska, Yukon and the Mackenzie District of the Northwest Territories (Vickery, 1967). Since that time I have received specimens which were not previously recorded. These belong to new species so it is necessary to describe them in order to bring our knowledge of the Orthoptera of this area up to date. Superficially, both new species described in this paper resemble known species and it was not until a detailed examination was made that they were discovered to be undescribed.

The first species resembles *Bruneria brunnea* (Thomas). It might have been recorded as a northern record for that species but for the fact that the locality in which it was found is 750 to 1,000 miles north of the previous records for *B. brunnea*. Comparison of the specimens at hand with specimens of *B. brunnea* from Chilcotin, British Columbia, and from 10 miles east of Fort MacLeod, Alberta, has revealed the resemblance to be superficial. Genitalic differences (Figs. 5 to 8) are so great that the new species should possibly be placed in a new genus, although at present it is tentatively assigned to *Bruneria*.

### *Bruneria yukonensis* NEW SPECIES

(Figs. 1-5, 7)

*Holotype*.—Male, "CANADA: Yukon, Lake LaBerge shore, 62° N.; 135° W., 23-VIII-1961, D. Marsh." A second label on the specimen bears the additional data: "W. shore of lake; deep creek, no trees, grassy slope burned out by sun." [Specimen in the Lyman Entomological Museum.]

Very similar in appearance to *B. brunnea* (Thomas), (Figs. 1 and 2), differing in the following external characters: head smaller in proportion to the body; frontal fastigium narrower near the vertex and sulcate below the median ocellus, gradually becoming obsolete (not terminating abruptly immediately below the ocellus as in *brunnea*); lateral foveolae of vertex narrower and decreasing in width at apices (not regularly rectangular as in *brunnea*); median carina of pronotum faintly cristate on prozona, elevated but not arcuate on metazona (not uniformly elevated on both as in *brunnea*); tegmina reaching nearly to the tip of the abdomen, 12.3 mm long (not slightly exceeding the tip of the abdomen as in *brunnea*, in which mean length of teg-

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mina of five specimens from Fort MacLeod, Alberta, is 14.8 mm). Measurements also differ slightly as follows (those for a mean of five specimens of *Brunnea* from the above locality are given in parentheses for comparison, all measurements in mm): width of vertex between the eyes, 1.1 (1.3); pronotal length, 3.2 (3.5); length of hind femur, 11.6 (11.1); length of hind tibia, 9.2 (8.9).



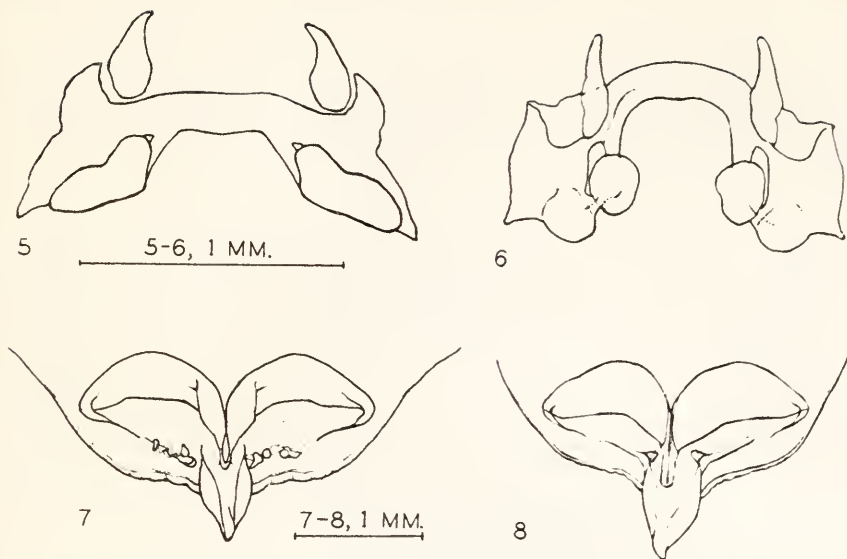
FIGS. 1-4. *Bruneria yukonensis*. FIG. 1. Holotype, male, dorsal view; FIG. 2. Holotype, male, lateral view; FIG. 3. Allotype, female, dorsal view; FIG. 4. Allotype, female, lateral view.

The color and color-pattern are as in *B. brunnea*, but tend in the holotype (as well as the others in the type series) to be somewhat accentuated, the paler areas having become bleached due to alcohol immersion.

The internal genitalia differ from those of *B. brunnea* (Fig. 6) mainly in the epiphallus (Fig. 5) being broader, the bridge flatter and the ancorae and lophi much heavier. These differences are clearly shown by comparison with several specimens of *brunnea* from the northern part of its range, both east and west of the continental divide, in Saskatchewan, Alberta and British Columbia, all of which conform to the type shown in Fig. 6. No significant differences were found between the aedeagal valves of the two species.

*Allotype*: Female, same data as the holotype.

Differs from the holotype in sexual characters and in size, the small size of the head in proportion to the body (Figs. 3 and 4), as compared with *B. brunnea*, is even more noticeable; median carina of pronotum uniformly elevated throughout; differing slightly from *B. brunnea* in the following measurements (those for a mean of five specimens from Fort MacLeod, Alberta, are given in parentheses for comparison, all measurements are in mm): width of vertex between eyes, 1.4 (1.6); pronotal length, 3.7 (3.8); length of hind femur, 11.6 (11.1); length of hind tibia, 9.2 (8.9); length of tegmina, 12.3 (14.8).



FIGS. 5-8. FIG. 5. Male epiphallus of *Bruneria yukonensis*, dorsal aspect; FIG. 6. Male epiphallus of *Bruneria brunnea* (Thomas), dorsal aspect; FIG. 7. Female subgenital plate of *Bruneria yukonensis*, dorsal aspect (removed and cleared); FIG. 8. Female subgenital plate of *Bruneria brunnea* (Thomas), dorsal aspect (removed and cleared).

The color and color pattern are very similar to those of *B. brunnea*.

The dorsal surface of the subgenital plate (Fig. 7—drawn from the paratype) differs from that of *B. brunnea* (Fig. 8) in being slightly broader, and in having the floor pouches somewhat narrower, but mainly in the degree of development of the "columellae" (*sensu* Randell, 1963), which in *yukonensis* are strongly developed, multiple, and occur over much of the length of the contact area, whereas in *brunnea*, they are single and located at the inner margins of the contact areas.

*Paratype*: One female, same data as the holotype.

Very similar to the allotype, differing only in the following measurements: pronotal length, 3.9; tegminal length, 15.1; hind femur, 12.1; hind tibia, 9.9 mm.

#### Key to species of *Bruneria*

1. Head small in proportion to body; tegmina reaching nearly to tip of abdomen; distribution northern. . . . . *B. yukonensis* Vickery

Head large in proportion to body; tegmina slightly exceeding tip of abdomen; distribution more southern (known only as far north as Jasper and Edmonton, Alberta, and Prince Albert and Lloydminster, Saskatchewan). . . . . *B. brunnea* (Thomas)

*Note*: No other species of this genus is found as far north as Canada but are confined to the southwestern United States.

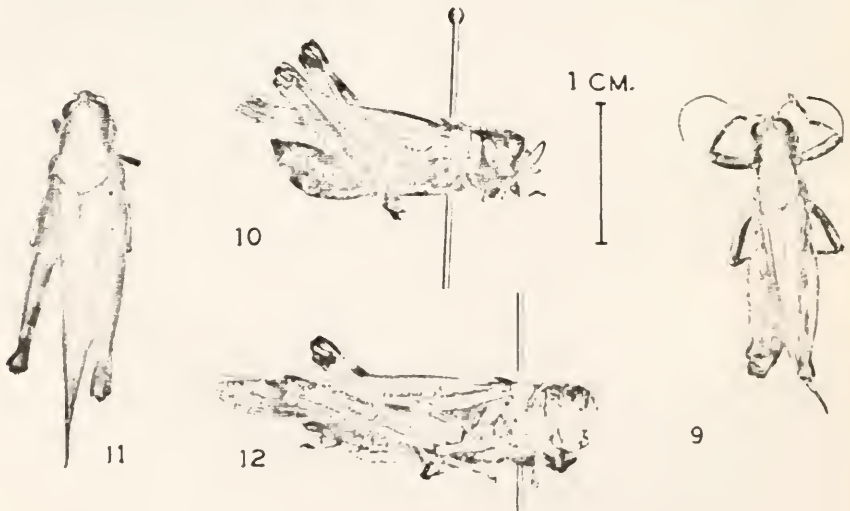
During the summer of 1968, several specimens of *Melanoplus* were collected near Fairbanks, Alaska, by Mrs. R. Gordon. Examination of these revealed that they are not conspecific with any of the known North American *Melanoplus*. They are here described as a new species and are named for Vivian Gordon, in appreciation of her interest and efforts in providing the specimens.

### *Melanoplus gordonae* NEW SPECIES

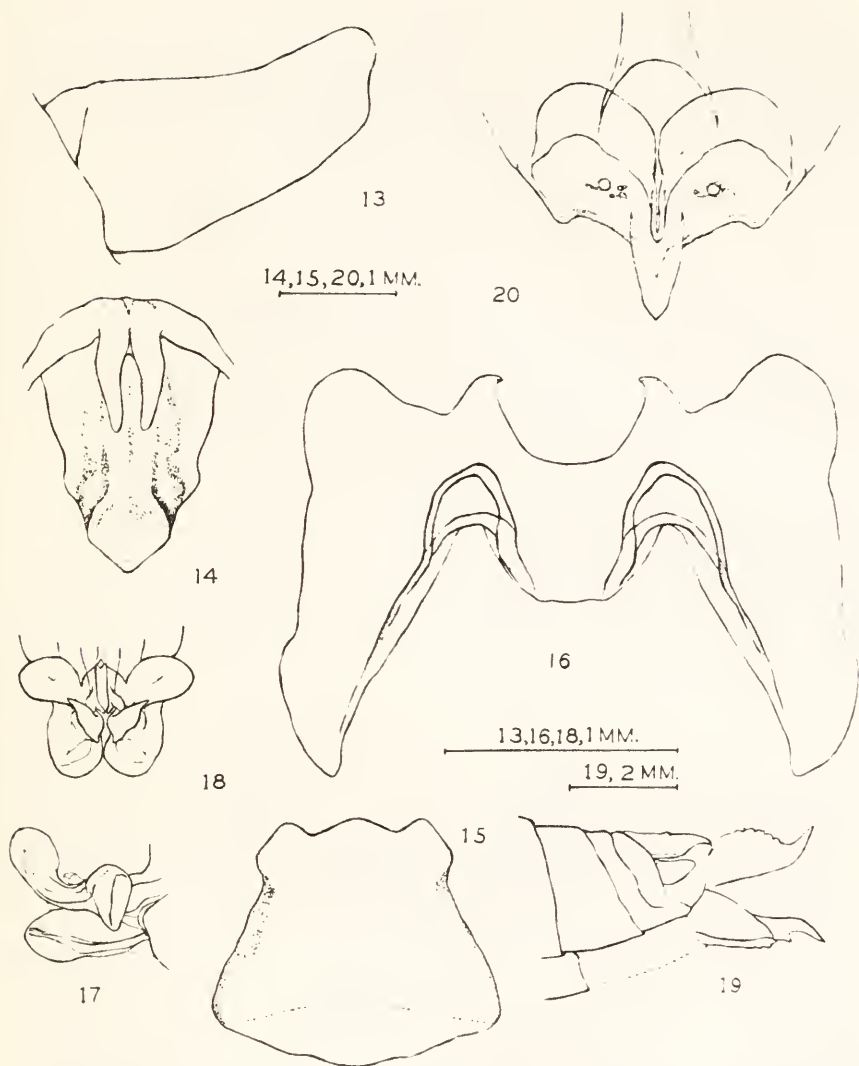
(Figs. 9-20)

*Holotype*.—Male, "U. S. A.: Alaska, nr. Fairbanks, 2 mi. along Gilmore Trail, 13-VIII-1968, V. Gordon." [Specimen in the Lyman Entomological Museum.]

Size similar to *Melanoplus femurrubrum femurrubrum* (De Geer), which it superficially resembles (Figs. 9 and 10), differing in the following respects: frontal costa broader and of generally uniform breadth (the slight enlargement at the level of the median ocellus more pronounced and abrupt), in profile projecting more in advance of the eyes, and with sulcation less pronounced than in *femurrubrum*; median carina of pronotum more elevated on metazona; subgenital plate distinctly trilobate at apex (Fig. 15), not entirely rounded as in *femurrubrum*; furculae more convergent (Fig. 14) but otherwise similar to *femurrubrum*; cerci much broader throughout, not distinctly narrowed at apex, and with apex distinctly emarginate (Fig. 13); comparative measurements of the holotype with the mean of a sample of five males of *femurrubrum* (in parentheses) from Salmon Arm, British Columbia, are as follows (all in mm): width of vertex between the eyes, 0.60 (0.43); pronotal length, 4.65 (4.10); fore femur length, 3.5 (3.3); hind femur length, 11.3 (11.0); length of hind tibia, 9.9 (8.6); tegminal length, 15.5 (14.7).



Figs. 9-12. *Melanoplus gordonae*. FIG. 9. Holotype, male, dorsal view; FIG. 10. Holotype, male, lateral view; FIG. 11. Allotype, female, dorsal view; FIG. 12. Allotype, female, lateral view.



FIGS. 13-20. *Melanoplus mordax*. FIG. 13. Left cercus of male, lateral aspect; FIG. 14. Furculae of male, dorsal aspect; FIG. 15. Subgenital plate of male, posterior aspect; FIG. 16. Epiphallus of male; FIG. 17. Aedeagal valves, male, dorsal aspect; FIG. 18. Aedeagal valves, male, dorsal aspect; FIG. 19. Terminal abdominal segments of female, showing cerci and ovipositor valves; FIG. 20. Female subgenital plate, dorsal aspect (removed and cleared).

The coloration is very similar to *femurrubrum*, both being without dark bars on the external face of the hind femur.

The internal genitalia differ from those of any other northern species of *Melanoplus*, the epiphallus is larger and much more heavily sclerotized with the bridge and lophi broader and heavier (Fig. 16); the aedeagal valves resemble those of *femurrubrum*, but are narrower apically in dorsal aspect (Fig. 18) and are more obtusely rounded in lateral aspect (Fig. 17).

*Allotype*: Female, same data as holotype (Figs. 11 and 12).

Differs from the holotype in sexual characters and in larger size, and in the fact that the hind femur shows indistinct barring dorsally which extends to the outer face over the upper chevrons. The dorsal area of the prozona appears reddish, but this may be due in part to alcohol immersion.

The female cerci are triangular but with both upper and lower edges strongly convex (not concave as in *M. femurrubrum* and are longer than those of *M. sanguinipes*; the dorsal ovipositor valves are broader (Fig. 19), with the "shoulder" angle of  $130^\circ$ , as compared with angles of  $133^\circ$  in *femurrubrum* and  $117^\circ$  in *sanguinipes* (Brooks, 1958); the tip of the ventral ovipositor valve appears longer. Comparative measurements of the allotype with the means of a sample of five females of *femurrubrum* from Salmon Arm, British Columbia (in parentheses) as follows (all in mm): width of vertex between the eyes, 0.65 (0.65); pronotal length, 5.2 (4.9); fore femur length, 3.5 (3.3); hind femur length, 13.3 (12.5); length of hind tibia, 11.4 (10.2); tegminal length, 22.0 (17.3).

The dorsal view of the female subgenital plate (Fig. 20) shows the edges with very strong posterolateral projections, much more accentuated than in other northern species of *Melanoplus*; the columellae are strongly sclerotized and more specialized.

Three additional specimens, probably belonging to this species, have the same locality data, but were collected earlier during the same season. They are all juvenile so that determination is not considered positive.

It is hoped that additional material will soon be collected at the type locality in order to increase our knowledge of this hitherto overlooked species.

#### KEY TO SPECIES OF *Melanoplus* FOUND IN ALASKA, YUKON AND MACKENZIE DISTRICT

(Most of the salient features are illustrated by Brooks, 1958 or Vickery, 1967).

1. Males.....	2
Females.....	0
2. Tegmina shorter than abdomen.....	3
Tegmina exceeding the abdomen.....	5

3. Hind femur banded on outer face.....4  
 Hind femur not banded on outer face, pale yellowish-brown.....  
 ..... **M. b. borealis** (Fieber)
4. Cercus broad at base and narrowing to blunt apex.....  
 ..... **M. frigidus** (Boheman)  
 Cercus long, sides subparallel, somewhat incurved and broadly  
 rounded at apex..... **M. fasciatus** (F. Walker)
5. Cercus broad, not strongly tapered on apical half.....6  
 Cercus strongly tapered on apical half; subgenital plate with  
 apex concave; confined to extreme southern part of Mackenzie  
 District..... **M. f. femurrubrum** (DeGeer)
6. Cercus large, rectangular, with rounded apex bent dorsally;  
 furculae small; apex of subgenital plate truncate or rounded  
 acute..... **M. k. kennicotti** Scudder  
 Cercus smaller, flat or nearly so; apex of subgenital plate  
 notched or trilobate.....7
7. Apex of subgenital plate trilobate, the lobes of equal height,  
 outer lobes projecting laterally and obliquely truncate (Fig. 15)....  
 ..... **M. gordonae** Vickery  
 Apex of subgenital plate notched.....8
8. Subgenital plate broader than deep; furculae medium-sized and  
 distinctly divergent..... **M. s. sanguinipes** (Fabricius)  
 Subgenital plate long, produced upward behind; furculae large,  
 long and nearly parallel..... **M. bruneri** Scudder
9. Tegmina not reaching the tip of the abdomen.....10  
 Tegmina exceeding the abdomen.....12
10. Hind femur banded on outer face.....11  
 Hind femur not banded..... **M. b. borealis** (Fieber)
11. Tegmina short, extending only to the fourth abdominal segment;  
 hind femur mainly pale with dark bands... **M. frigidus** (Boheman)  
 Tegmina longer, extending beyond the sixth abdominal segment;  
 hind femur mainly dark with pale bands... **M. fasciatus** (F. Walker)
12. Dorsal surface of tegmina spotted; tegmina just reaching apices  
 of hind femora..... **M. k. kennicotti** Scudder  
 Dorsal surface of tegmina not spotted, tegmina exceeding apices  
 of hind femora.....13
13. Antennal crescent not divided; hind femur without bands.....  
 ..... **M. f. femurrubrum** (DeGeer)  
 Antennal crescent divided; hind femur banded.....14
14. Lower flange of hind femur with pink to reddish stripe on outer  
 surface; dorsal angle of upper ovipositor valve  $117^\circ$ .....  
 ..... **M. s. sanguinipes** (Fabricius)  
 Lower flange of hind femur entirely yellow; dorsal angle of  
 upper ovipositor valve greater than  $125^\circ$ .....15
15. Upper edge of cercus straight; dorsal angle of upper ovipositor  
 valve  $145^\circ$ ..... **M. bruneri** Scudder  
 Both edges of cercus convex; dorsal angle of upper ovipositor  
 valve  $130^\circ$ ..... **M. gordonae** Vickery

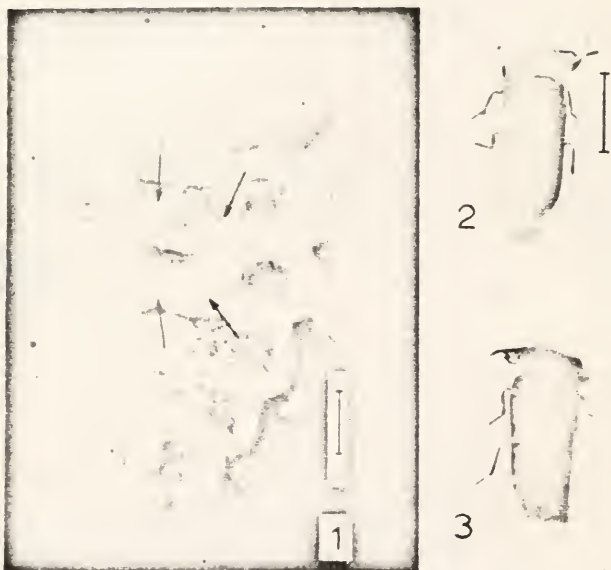
## ACKNOWLEDGMENTS

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(Continued from p. 251)



FIGURES 1-3. FIG. 1. Photomicrograph of the abdominal sternites of *Pleotomus nigripennis* LeConte; FIG. 2. Dorsal view of *Pleotomus nigripennis* LeConte; FIG. 3. Ventral view of same. (Line figure 1 equals 1 mm, Figs. 2 and 3 equals 5 mm.)

influence. This is the first evidence of light production in the genus *Pleotomus*. The active period of the adult male beetles within the Monument is limited to the period from the last week of May to the end of July.

The author is indebted to the late J. W. Green for determining material and distributional data and to Robert and Soori Bell, students at this Institution, for their observations of this phenomenon.—ERBERT L. STEEBE, *Entomology, California State College, Long Beach, California 90801.*